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COMPUTER PROGRAM DOCUMENTATION

USER'S GUIDE

TO THE

UTIL-ODRC TAPE PROCESSING PROGRAM

JOB ORDER 52-309

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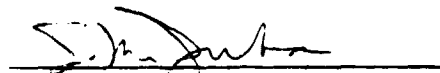
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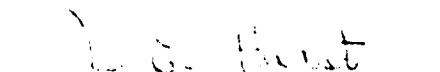
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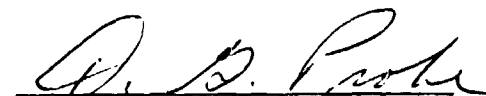
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16. Abstract This document describes the UTIL-ODRC CCT-tape processing program, its I/O options and requirements, and its interface with the EXEC 8 Operating System.					
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DESCRIPTION OF TERMS

BATCH PLOT, FLOPLT, PRAMPT	- SINDA Temperature History Plotting Programs
CCT	- Computer Compatible Tape
I/O	- Input/Output
K	- 1024 words of storage
NTRAN	- UNIVAC/FORTRAN V Data Transfer Routine
ODRC	- Orbital Data Reduction Center
SINDA	- Systems Improved Numerical Differencing Analyzer

1. INTRODUCTION

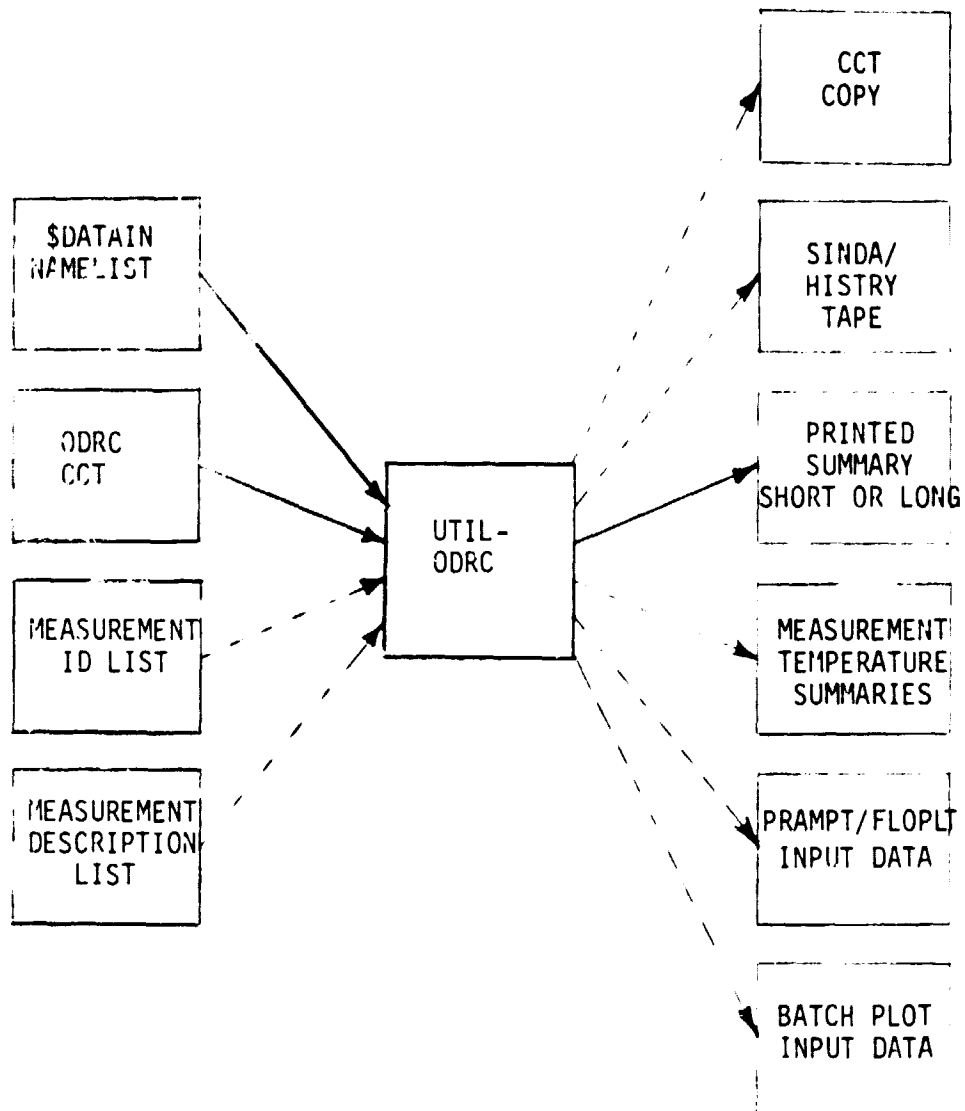
The UTIL-ODRC program has been designed as a multi-purpose ODRC tape processing utility, and provides the user with the ability to create: 1) tape copies: exact duplicate and/or SINDA/HISTORY format, 2) plot data elements for PRAMPT/FLOPLT and/or BATCH PLOT programs, and 3) a printed summary. Consequently, execution of UTIL-ODRC allows the user to view ODRC data rapidly, with the data presented in a manner most suited to the user's analytic method.

2. PROGRAM DESCRIPTION

2.1 OVERVIEW

Figure 1 shows the input required and output produced by UTIL-ODRC. The program processes one raw ODRC data CCT as specified by the user in both the \$DATAIN namelist, and an optional list of measurement identifiers following the namelist in the input stream. In addition, a measurement description list will be made available to the program if the user chooses to build a PRAMPT/FLOPLT input data element.

Output may take the form of: a duplicate of the original tape, a SINDA/HISTORY format tape, a PRAMPT/FLOPLT input data element, a BATCH PLOT input data element, and/or summary information displayed on the terminal or on line printer copy.



----- OPTIONAL I/O

Figure 1 - Input and Output of UTIL-ODRC

2.2 INPUT

Up to four input entities may be required by UTIL-ODRC: a raw ODRC data CCT, the \$DATAIN namelist, a list of measurement identifiers or relative measurement numbers, and a measurement description list. Only the CCT and namelist inputs are required to execute this program. Namelist variables, their possible and default values and their meaning to the program are listed in Appendix A. If detailed summary output is desired for particular measurements, a list of measurement identifiers may be appended to the namelist, and namelist variable REALM must be true. If the relative locations of the desired measurements on the CCT are known to the user, namelist array MREL can be assigned these relative values. Relative location specifications must occupy consecutive positions in the array, beginning with MREL(1), and REALM must be false.

The measurement description list is read when the user specifies PRAMPT/FEOPLT data output by setting namelist variable BLDELT to true. The list supplies a description and range of values for each measurement, to be used, respectively, to title the plot, and to insure appropriate y-axis limits.

2.3 PROCESSING

The general flow of control in UTIL-ODRC is schematically depicted in Appendix B. The program uses NTRAN I/O processing when reading or copying an ODRC CCT. Except for namelist reading and writing, all other I/O is formatted. Formatted main storage transfer (DECODE) is invoked when further examination of NTRAN input is necessary.

Program termination occurs in one of three ways: error exit with diagnostic message, error exit due to bad tape (no message), or normal termination. Table I describes the causal conditions for each type of exit.

TABLE 1 - CAUSAL CONDITIONS FOR ERROR EXIT

<u>TYPE OF EXIT</u>	<u>CONDITIONS</u>
ERROR WITH MESSAGE	Number of measurements on tape exceeds the capacity of the program
	Error in namelist
	Number of records per scan >5
ERROR WITHOUT MESSAGE (values output before error abort)	Number of physical records ≤ 0
	Sequential record counter ≤ 0
	Size of data records ≤ 0
	Scans per data record = 0
	Number of scans ≤ 0
NORMAL	IYEAR = 1: End of CCT data

2.4 OUTPUT

This section pertains only to UTIL-ODRC output resulting from normal program termination. For information concerning error abort, see the preceding section on processing.

All output from UTIL-ODRC is optional excepting a short printed summary of the ODRC data records processed by the program, as in Figure 2. A long summary printout is also available, as shown in Figure 3, and is obtained by setting namelist variable PRINT to true.

Printed summary information for specific measurements can be output when REALM is true, and a list of the actual measurement identifiers follows the namelist, or when REALM is false, and array MREL contains integers identifying the relative positions, on the CCT, of the measurements of interest.

Then either variable PRNTMP or MAXMIN (or both) may be set to true, producing a printout of all temperatures, or the maximum and minimum temperature, for each specified measurement. Figures 4 and 5 show examples of output generated by these options.

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HEADER= 2048
TAPE ID= CTC51L
NUMBER OF PHYSICAL RECORDS=      8
SEQUENTIAL RECORD COUNTER =      1
SIZE OF DATA RECORDS =      440 WORDS
SCANS PER DATA RECORD =      -2
LOCAL DATE=05/01/81
LOCAL TIME=07:07:30
SCAN SIZE= 843 WORDS
HEADER= 2048
TAPE ID= CTC51L
NUMBER OF PHYSICAL RECORDS=      8
SEQUENTIAL RECORD COUNTER =      2
SIZE OF DATA RECORDS =      440 WORDS
SCANS PER DATA RECORD =      -2
LOCAL DATE=05/01/81
LOCAL TIME=07:07:30
SCAN SIZE= 843 WORDS
HEADER= 2048
TAPE ID= CTC51L
NUMBER OF PHYSICAL RECORDS=      8
SEQUENTIAL RECORD COUNTER =      3
SIZE OF DATA RECORDS =      440 WORDS
SCANS PER DATA RECORD =      -2
LOCAL DATE=05/01/81
LOCAL TIME=07:07:30
SCAN SIZE= 843 WORDS

```

Figure 2 - Short Printout Option Example

```

1 ##### MEASUREMENT NUMBER E41T1010B
SAMPLES PER SCAN                      1
WORD NO. IN SCAN OF FIRST SAMPLE      16
TIME DELTA FOR FIRST SAMPLE            .000
TIME DELTA BETWEEN CONTIGUOUS SAMPLES .000
PRECISION CODE 1-SP 2-DP              2
TIME SKEW WORD NUMBER                  4
2 ##### MEASUREMENT NUMBER E41T1011B
SAMPLES PER SCAN                      1
WORD NO. IN SCAN OF FIRST SAMPLE      18
TIME DELTA FOR FIRST SAMPLE            .000
TIME DELTA BETWEEN CONTIGUOUS SAMPLES .000
PRECISION CODE 1-SP 2-DP              2
TIME SKEW WORD NUMBER                  4
3 ##### MEASUREMENT NUMBER E41T1012B
SAMPLES PER SCAN                      1
WORD NO. IN SCAN OF FIRST SAMPLE      20
TIME DELTA FOR FIRST SAMPLE            .000
TIME DELTA BETWEEN CONTIGUOUS SAMPLES .000
PRECISION CODE 1-SP 2-DP              2
TIME SKEW WORD NUMBER                  4
4 ##### MEASUREMENT NUMBER E41T1013B
SAMPLES PER SCAN                      1
WORD NO. IN SCAN OF FIRST SAMPLE      22
TIME DELTA FOR FIRST SAMPLE            .000
TIME DELTA BETWEEN CONTIGUOUS SAMPLES .000
PRECISION CODE 1-SP 2-DP              2
TIME SKEW WORD NUMBER                  4

```

Figure 3 - Long Printout Option Example

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TIME FOR THIS SCAN	.905850000000+007		STIME=	20.2500
	E41T1010B	.00000000		
	U09T9821A	.85630054+02		
	U12T9360A	.14368934+03		
	U37T9171A	.64946630+02		
	U41T1201C	-.40477694+03		
TIME FOR THIS SCAN	.905856000000+007		STIME=	20.2666
	E41T1010B	.00000000		
	U09T9821A	.85630054+02		
	U12T9360A	.14368934+03		
	U37T9171A	.64946630+02		
	U41T1201C	-.40477694+03		
TIME FOR THIS SCAN	.905862000000+007		STIME=	20.2833
	E41T1010B	.00000000		
	U09T9821A	.85630054+02		
	U12T9360A	.14368934+03		
	U37T9171A	.64946630+02		
	U41T1201C	-.40477694+03		
TIME FOR THIS SCAN	.905868000000+007		STIME=	20.3000
	E41T1010B	.00000000		
	U09T9821A	.85630054+02		
	U12T9360A	.14368934+03		
	U37T9171A	.64946630+02		
	U41T1201C	-.40477694+03		
TIME FOR THIS SCAN	.905874000000+007		STIME=	20.3167
	E41T1010B	.00000000		
	U09T9821A	.85630054+02		
	U12T9360A	.14374630+03		
	U37T9171A	.64946630+02		
	U41T1201C	-.40477694+03		

Figure 4 - Sample Temperature Printout

	MAXIMUM		MINIMUM	
	TIME	TEMP	TIME	TEMP
E41T1010B	18.35	.00	18.35	.00
U09T9821A	18.35	193.05	20.50	.00
U12T9360A	20.48	145.19	18.35	.00
U37T9171A	20.42	67.53	20.50	.00
U41T1201C	18.35	.00	18.48	-404.78

Figure 5 - Sample Maximum and Minimum
Temperature Printout

In addition to printed output, UTIL-ODRC will produce a copy of the ODRC CCT if variable COPY is true, and will reformat the CCT data into SINDA temperature history form if HISTRY is true.

Input data for plotting programs can be produced by UTIL-ODRC to facilitate trend analysis. PRAIPT/FLOPLT input data is created by setting variable BLDELT to true. An example of the data produced is shown in Figure 6. BATCH PLOT input data is output when BLDBAT is true, and a sample of this data is listed in Figure 7.

379161ST	03779161A	PBD R SKIN TEMP X 1000	-200.0000	450.0000
379166ST	03779162A	PBD R SKIN TEMP X 613	-200.0000	450.0000
-379171ST	03779171A	PBD L BLKHD LATCH MOTOR TEMP X 530	-200.0000	450.0000
379172ST	03779172A	PBD R BLKHD LATCH MOTOR TEMP X 130	-200.0000	450.0000
379181ST	03779181A	PBD L ACTR MOTOR TEMP	-200.0000	450.0000
-379182ST	03779182A	PBD R ACTR MOTOR TEMP	-200.0000	450.0000
-389272ST	03879272A	AFT FUS UPR FLD BULK AIR TEMP	-250.0000	550.0000
389275ST	03879275A	AFT FUS TOP REAR BULK AIR TEMP	-250.0000	550.0000
389276ST	03879276A	AFT FUS UPR CENTER BULK AIR TEMP	-250.0000	550.0000
-389277ST	03879277A	AFT FUS LAR CENTER BULK AIR TEMP	-250.0000	550.0000
389278ST	03879278A	AFT FUS LAR RIGHT BULK AIR TEMP	-250.0000	550.0000
-389292ST	03879292A	AFT FUS LH VENT DOOR MOTOR	-200.0000	450.0000
389421ST	03879421A	RH OMS RCS POD VENT AND PURGE TEMP	0000	450.0000
389422ST	03879422A	LH OMS RCS POD VENT AND PURGE TEMP	0000	450.0000
-411101ST	04171101C	MPS-ENG NO 1 LHE INLET TEMP	-430.0000	-405.0000
-4111131ST	04171113C	MPS-ENG NO 1 LOX INLET TEMP	-205.0000	-255.0000
-4111151ST	04171115C	MPS E-1 AFT FUSLG HE SUPPLY TEMP	-325.0000	300.0000
-411152ST	04171152A	MPS E-1 MID FUSLG HE SUPPLY TEMP	-325.0000	300.0000
-411161ST	04171161A	MPS-ENG NO 1 GHE PRESS OUTLET TEMP	-325.0000	500.0000
-411171ST	04171171A	MPS-ENG NO 1 SOX PRESS OUTLET TEMP	-150.0000	650.0000
-4111301ST	04171130C	MPS-ENG NO 2 LHE INLET TEMP	-430.0000	-405.0000
-411131ST	04171131C	MPS-ENG NO 2 LOX INLET TEMP	-205.0000	-255.0000
-4111251ST	04171251A	MPS E-2 AFT FUSLG HE SUPPLY TEMP	-325.0000	300.0000
-4111252ST	04171252A	MPS E-2 MID FUSLG HE SUPPLY TEMP	-325.0000	300.0000
-4111261ST	04171261A	MPS-ENG NO 2 GHE PRESS OUTLET TEMP	-325.0000	500.0000
-4111271ST	04171271A	MPS-ENG NO 2 SOX PRESS OUTLET TEMP	-150.0000	650.0000
4111321ST	04171321C	MPS-ENG NO 3 LHE INLET TEMP	-430.0000	-405.0000

[illegible]

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3. SYSTEM INTERFACE

3.1 LOGICAL UNIT REQUIREMENTS

One logical unit must be assigned to the job before executing UTIL-ODRC, and corresponds to the raw ODRC CCT. Any necessity for other temporary file assignments is determined by \$DATAIN namelist input. Table II lists the namelist specifications that affect logical unit assignments. If a variable in the left column has been set to true, the corresponding logical unit variable in the center column must be assigned an integer unit number (1-29 except 5, 6 and 8), and that temporary logical unit file must be assigned to the job before attempting execution. To use the default unit specifications, simply assign the corresponding temporary file to the run before execution. The program will then perform I/O on the appropriate units as listed in the rightmost column of Table II.

TABLE II - NAMELIST EFFECTS ON LOGICAL UNIT REQUIREMENTS

<u>OUTPUT OPTION FLAG</u>	<u>CORRESPONDING LOGICAL UNIT VARIABLE</u>	<u>DEFAULT UNIT</u>
COPY	IOUT	2
HISTORY	IBIN	3
BLDELT	IELT	4
BLDBAT	IBAT	7

Note that units 5, 6, and 8 are not available for user assignment. Units 5 and 6 are the standard system default input and output files, respectively, and should never be assigned by the user. Unit 8 contains the measurement description list which is used when building a PRAMPT/FLOPLT data element (BLDELT true), but may be assigned by the user for other purposes if BLDELT is false.

3.2 PROGRAM COLLECTION

UTIL-ODRC consists of three routines: the main routine, a routine that searches and extracts data from a measurement description list (FINDID), and a time conversion routine (DPSECW). FINDID is called only when building a PRAMPT/FLOPLT data element (BLDELT true). A MAP processor input element is available in ES3-L74338*PLOT, with element name UTIL-ODRC/MAP. Its use is illustrated in the runstream examples in Appendix C. After collection, instruction and data banks occupy approximately 26.5K words of storage, within the required storage limits for interactive execution, and well within batch submission limits.

APPENDIX A
\$DATAIN NAMELIST VARIABLE DESCRIPTION

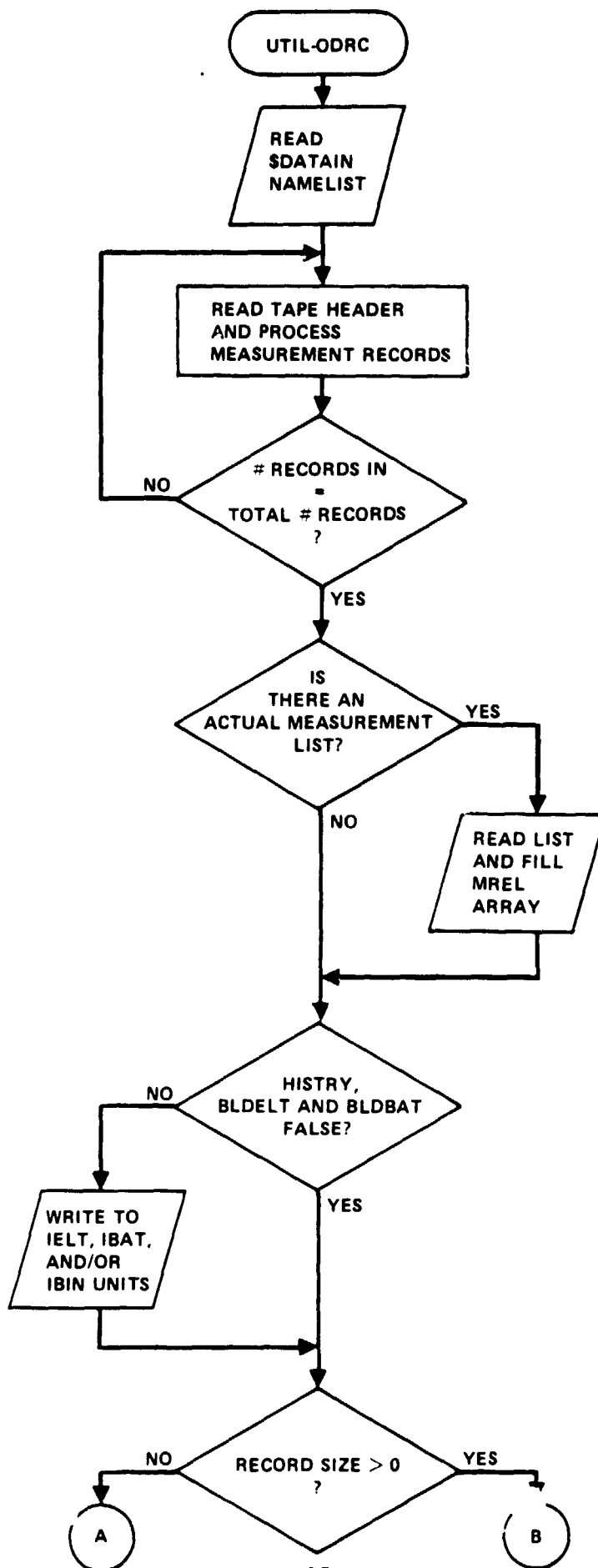
\$DATAIN NAMELIST VARIABLE DESCRIPTION

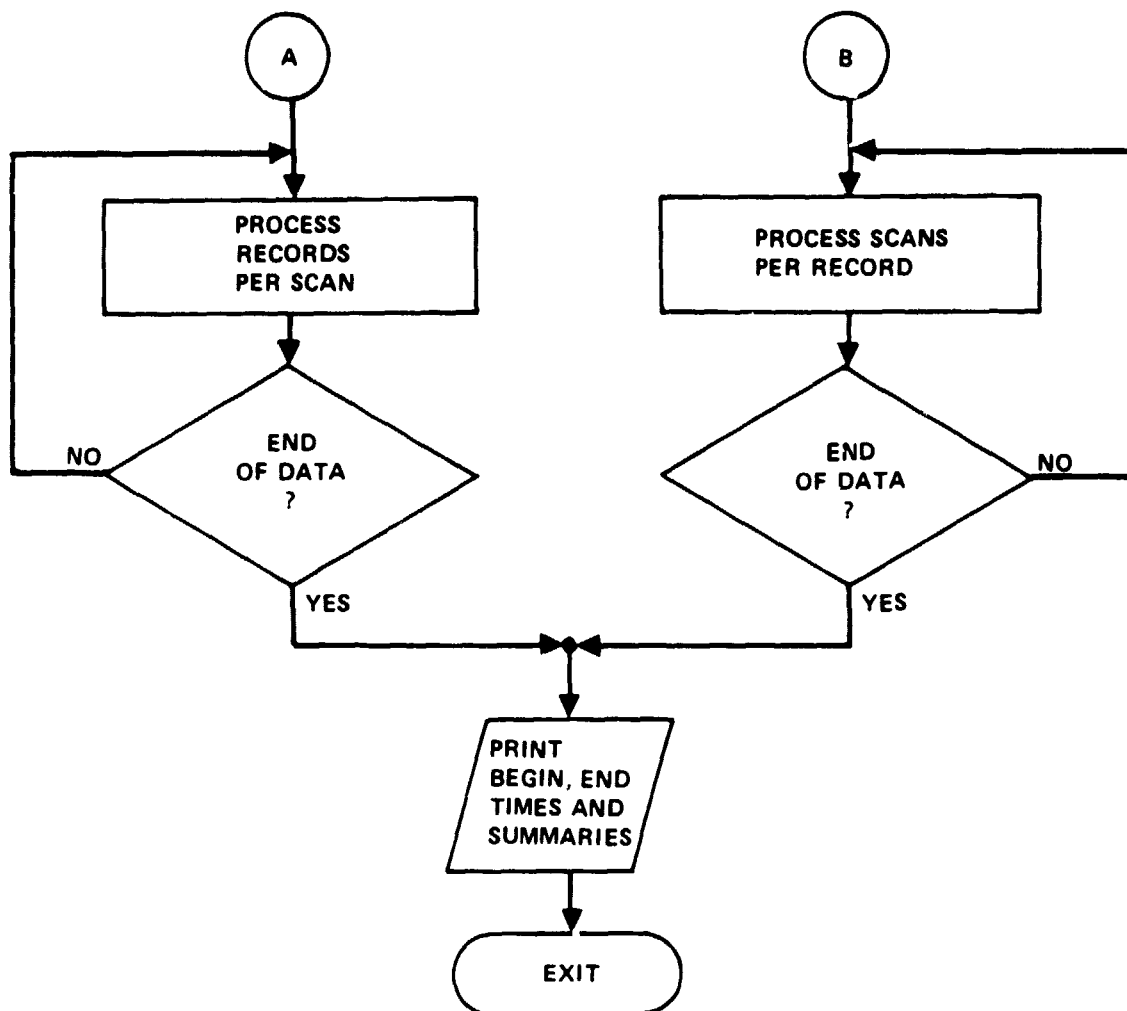
<u>NAME</u>	<u>DESCRIPTION</u>	<u>RANGE</u>	<u>DEFAULT</u>
IN	Raw CCT Input Unit	1-29, except 5,6&8	1
COPY	Copy Flag if TRUE, copy CCT on IOUT if FALSE, no copy	True or False	False
IOUT	Copy Output Unit	1-29, except 5,6&8	2
HISTORY	SINDA/HISTORY Flag if TRUE, make data look like SINDA/HISTORY output on unit IBIN if FALSE, no HISTORY output	True or False	False
IBIN	SINDA/HISTORY Output Unit	1-29, except 5,6&8	3
BLDELT	PRAMPT/FLOPLT Data Flag if TRUE, output data for use with plotting programs PRAMPT or FLOPLT on IELT if FALSE, no PRAMPT/FLOPLT output	True or False	False
IELT	PRAMPT/FLOPLT Data Output Unit	1-29, except 5,6&8	4
MCOUNT	Minus Sign Interval for PRAMPT/FLOPLT Data: Number of Measurements per Plot	2,3,4,5	5
BLDBAT	BATCH PLOT Data Flag if TRUE, output measurement list for use with BATCH PLOT on IBAT if FALSE, no BATCH PLOT output	True or False	False
IBAT	BATCH PLOT Data Output Unit	1-29, except 5,6&8	7
PRINT	Print Flag if TRUE, produce full printout if FALSE, produce short printout	True or False	False
REALM	Actual Measurement ID List Flag if TRUE, list of ID's will follow namelist if FALSE, no list	True or False	False

\$DATAIN NAMELIST VARIABLE DESCRIPTION
(Continued)

<u>NAME</u>	<u>DESCRIPTION</u>	<u>RANGE</u>	<u>DEFAULT</u>
MREL (I) I=1,50	List of Relative Measurement Numbers for which summaries will be Output	Integers	50 * 0
PRNTMP	Temperature Printout Flag if TRUE, print temperatures for all measurements in list if FALSE, no temperature printout	True or False	False
MAXMIN	Maximum and Minimum Temperature Print Flag if TRUE, print maximum and minimum temperatures for all measurements in list if FALSE, no max and min printout	True or False	False

APPENDIX B
UTIL-ODRC FLOW OF CONTROL





APPENDIX C
RUNSTREAMS

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1:ORUN,S/R URUNID,ES3/PROJ,ES3-NBADGE,TPLIMIT PGLIMIT
2:OUSE P,ES3-L74338*PLOT
3:OUSE URFILE,ES3-NBADGE*FILENM . RETYPE YOUR BADGE NO. & FILENAME
4:OASG,T 1,U9U,X88888 . X-BIN NO. FOR ODRG TAPE
5:OJSC*CALLUP.TAPELABEL . GET NEW TAPE FOR HISTRY OUTPUT
6:OASG,T 3,U9U,,99 . ODRG-HISTRY FOR X88888
7:OJSC*CALLUP.TAPELMBEL . GET NEW TAPE FOR OUT COPY
8:OASG,TJ 2,U9U,,99 . FREE COPY OF X88888
9:ORELIND 1. . REWIND RAL ODRG OUT
10:OASG,T 4,F40 . ASSIGN PERMT.FLUPLT DATA UNIT
11:OASG,T 7,F40 . ASSIGN BATCH PLOT DATA UNIT
12:OASG,T 8,F40 . ASSIGN MEASUREMENT DESCRIPTION LIST UNIT
13:OED P.MEASURELISTATOS.3. . COPY DESCRIPTION LIST INTO FILE UNIT
14:EXIT
15:OHP F.UTIL-ODRG/MP.UTILABS . COLLECT ROUTINES AND CREATE MEASLISTE
16:OXQT UTILABS
17:SDATAIN
18: COPY-T,
19: COUNT-B,
20: BLDBAT-T,
21: HISTRY-T,
22: REALM-T,
23: BLDELT-T,
24: PRINT-T,
25:SEND
26:E41T:010B
27:009T9821A
28:012T2360A
29:027T9171A
30:041T1201C
31:OCOP-1: 1.,URFILE.MEASLIST-ODRG . BATCH PLOT INPUT ELEMENT
32:OCOP-1: 4.,URFILE.FLUPLT-UTIL-ODRG . PERMT.FLUPLT INPUT ELEMENT
33:OCFN

```

Figure C-1

Batch Runstream with Namelist and Measurement List

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```

1:0FREE 1.
2:0FREE 2.
3:0FREE 3.
4:0FREE 4.      . FREE ANY ASSIGNED UNITS
5:0FREE 7.
6:0FREE 8.
7:0DELETE,C 1.
8:0DELETE,C 2.
9:0DELETE,C 3.
10:0DELETE,C 4.      . DELETE ANY CATALOGUED FILES
11:0DELETE,C 7.
12:0DELETE,C 9.
13:0DELETE,C PFLO.
14:0USE P,ES30,140,15.
15:0USE URFILE,ES30,140,15,FILENAME . RETYPE YOUR ENCODED FILENAME
16:0ASG,C PFLO. . ASSIGN PRINT FILE
17:0BRKPT PRINTS,PFLO . START WRITING TO PRINT FILE
18:0ASG,T 1,090,X88888 . 88888 . X-BIN NO. FOR LOGO TAPE
19:0JSC&CALLUP.TAPELABEL . GET NEW TAPE FOR HISTORY OUTPUT
20:0ASG,TJ 3,090,99 . CORO-HISTORY FOR X88888
21:0JSC&CALLUP.TAPELABEL . GET NEW TAPE FOR OCT COPY
22:0ASG,TJ 2,090,99 . TAPE COPY OF X88888
23:0REWIND 1. . REWIND RAL CORO COPY
24:0ASG,T 4,F40 . ASSIGN FRAMPT FLOPLT DATA UNIT
25:0ASG,T 7,F40 . ASSIGN BATCH PLOT DATA UNIT
26:0ASG,T 3,F40 . ASSIGN MEASUREMENT DESCRIPTION LIST UNIT
27:0ED F,MEASURELIST TOS,3. . COPY DESCRIPTION LIST INTO FILE UNIT
28:EXIT
29:0MAF P,UTIL-1,10,10,UTILINES . COLLECT ROUTINES AND CREATE RESOLUTS
30:0XOT UTIL45
31:0DATAIN
32:0COPY+T.
33:0COUNT+3.
34:0LDBAT+T.
35:0HISTORY+T.
36:0REALM+T.
37:0BLIELT+T.
38:0PRINT+T.
39:0END
40:0E4T1010E
41:005T5321H
42:012T5321H
43:007T9171H
44:044T1201C
45:0COPY,I 7,URFILE,MLIST UTIL-1,091 . BATCH PLOT INPUT ELEMENT
46:0COPY,I 4,URFILE,FLDATA UTIL-1,090 . FRAMPT FLOPLT INPUT ELEMENT
47:0BRKPT PRINTS . STOP WRITING TO PRINT FILE
48:0FREE PFLO. . FREE THE PRINT FILE FOR SWAPPING
49:0SYN,C PFLO. . SEND PRINT FILE TO SYSTEM PRINTER

```

Figure C-2

Demand Runstream with Namelist and Measurement List

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1: @RUN, S/R URUNID, ES3/PROJ, ES3-NBADGE, TMLIMIT, PGLIMIT
2: @USE P, ES3-L74338*PLOT
3: @USE URFILE, ES3-NBADGE*FILENM . RETYPE YOUR BADGE NO. & FILENAME
4: @ASG, T 1, U9U, X***** . X-BIN NO. FOR ODRC TAPE
5: @JSC*CALLUP, TAPELABEL . GET NEW TAPE FOR HISTRY OUTPUT
6: @ASG, T 3, U9U, .99 . ODRC-HISTRY FOR X*****
7: @JSC*CALLUP, TAPELABEL . GET NEW TAPE FOR OCT COPY
8: @ASG, TJ 2, U9U, .99 . TAPE COPY OF X*****
9: @REWIND 1. . REWIND PAL ODRC OCT
10: @ASG, T 4, F40 . ASSIGN PRAMPT/FLOPLT DATA UNIT
11: @ASG, T 7, F40 . ASSIGN BATCH PLOT DATA UNIT
12: @ASG, T 8, F40 . ASSIGN MEASUREMNT DESCRIPTION LIST UNIT
13: @ED P, MEASURELIST/TCS, 3. . COPY DESCRIPTION LIST INTO FILE UNIT
14: @EXIT
15: @MAP F, UTIL-ODRC/MAP, UTILABS . COLLECT ROUTINES AND CREATE ABSOLUTE
16: @XQT UTILABS
17: $DATAIN
18: COPY=T,
19: MCOUNT=3,
20: BLDBAT=T,
21: HISTRY=T,
22: REALM=T,
23: BLDELT=T,
24: PRINT=T,
25: $END
26: E41T1010B
27: U09T9821A
28: U12T9260A
29: U37T9171A
30: U41T1201C
31: @COPY, I 7, URFILE, MLIST UTIL-ODRC . BATCH PLOT INPUT ELEMENT
32: @COPY, I 4, URFILE, FLODATA UTIL-ODRC . PRAMPT/FLOPLT INPUT ELEMENT
33: @FIN

```

Figure C-1

Batch Runstream with Namelist and Measurement List

ORIGINAL PAGE IS
OF POOR QUALITY

```

1:FREE 1.
2:FREE 2.
3:FREE 3.
4:FREE 4.
5:FREE 7.
6:FREE 8.
7:DELETE,C 1.
8:DELETE,C 2.
9:DELETE,C 3.
10:DELETE,C 4.
11:DELETE,C 7.
12:DELETE,C 8.
13:DELETE,C PFLO.
14:USE P,ES3-L74333,PFLO
15:USE URFILE,ES3-MS-DGE,FILENM . REPLY YOUR BADGE NO. & FILENAME
16:ASG,C PFLO. . ASSIGN PRINT FILE
17:BRKPT PRINT,PFLO . STOP WRITING TO PRINT FILE
18:ASG,T 1,USU,X$$. . $$. * X-BIN NO. FOR QDRC TAPE
19:JSC*CALLUP,TAPELABEL . GET NEW TAPE FOR HISTORY OUTPUT
20:ASG,TJ 3,USU,,99 . QDRC-HISTORY FOR X$$$
21:JSC*CALLUP,TAPELABEL . GET NEW TAPE FOR OCT COPY
22:ASG,TJ 2,USU,,99 . TAPE COPY OF X$$$
23:REWIND 1. . REWIND RAW QDRC OCT
24:ASG,T 4,F40 . ASSIGN PRAMPT FLOPLT DATA UNIT
25:ASG,T 7,F40 . ASSIGN BATCH PLOT DATA UNIT
26:ASG,T 3,F40 . ASSIGN MEASUREMENT DESCRIPTION LIST UNIT
27:ED P,MEASURELIST,TCS,8. . COPY DESCRIPTION LIST INTO FILE UNIT
28:EXIT
29:MAP P,UTIL-QDRC-PHF,UTILAB5 . COLLECT ROUTINES AND CREATE ABSOLUTE
30:XOT UTILAB5
31:$DATAIN
32: COPY=T,
33: MOUNT=3,
34: BLDBAT=T,
35: HISTORY=T,
36: REALM=T,
37: BLDELT=T,
38: PRINT=T,
39:$END
40:E4IT1010B
41:J09T9321A
42:J12T9360A
43:J37T9171A
44:J41T1201C
45:CCPY,I 7,,URFILE,MLIST,UTIL-QDRC . BATCH PLOT INPUT ELEMENT
46:CCPY,I 4,,URFILE,FLODATA,UTIL-QDRC . PRAMPT FLOPLT INPUT ELEMENT
47:BRKPT PRINT . STOP WRITING TO PRINT FILE
48:FREE PFLO. . FREE THE PRINT FILE FOR SYM'ING
49:SYM,U PFLO. . SEND PRINT FILE TO SYSTEM PRINTER

```

Figure C-2

Demand Runstream with Namelist and Measurement List